We claim:

1. An artificial-reverberation generating device comprising a real-time convolution engine and an impulse-response synthesizer coupled to said real-time convolution engine for supplying impulse-response information to the convolution engine.

2. A device as claimed in Claim 1, wherein the impulse-response synthesizer comprises a noise synthesizer and control means for controlling one or more parameters of the noise synthesizer, thereby to control corresponding characteristics of the generated reverberation.

3. A device as claimed in Claim 2, wherein the noise synthesizer comprises, for each of two or more audio channels:
   - a noise generator;
   - a density generator connected to an input of the noise generator;
   - a phase-correlation means connected to an output of the noise generator, and
   - a filter and amplitude-envelope generator means connected to an output of the phase-correlation means.

4. A device as claimed in Claim 3, wherein the filter and amplitude-envelope generator means comprises a filter means and an amplifier means connected downstream of the filter means.

5. A device as claimed in Claim 4, wherein the density generator comprises a spike generator for generating a series of spikes having a definable decay time.

6. A device as claimed in Claim 5, comprising a means for randomly varying a time interval between successive spikes between two limits.

7. A device as claimed in Claim 6, wherein the noise generator comprises a pseudo-random number generator for generating noise, and a first multiplier for multiplying the series of spikes with the output of the pseudo-random number generator.

8. A device as claimed in Claim 7, comprising a pair of pseudo-random number generators for each audio channel, the pseudo-random number generators of one channel having seeds which are different from those of another channel.

9. A device as claimed in Claim 8, comprising a separate density generator for each of the pseudo-random number generators.

10. A device as claimed in Claim 8, comprising a mixing arrangement for each audio channel, the mixing arrangement for mixing the outputs of the pair of first multipliers.

11. A device as claimed in Claim 10, wherein the mixing arrangement comprises a low-pass filter and a high-pass filter fed by respective outputs of the pair of first multipliers.

12. A device as claimed in Claim 11, wherein the low-pass and high-pass filters have approximately the same cut-off frequency.

13. A device as claimed in Claim 12, wherein the mixing arrangement comprises a summing means for summing the output of the low-pass filter with the output of the high-pass filter.

14. A device as claimed in Claim 13, wherein the filter means is a time-variant filter, the cut-off frequency of which is controlled by a first envelope generator.

15. A device as claimed in Claim 14, wherein the amplitude envelope generator means comprises a variable-gain amplifier having a gain controlled by a second envelope generator.

16. A device as claimed in Claim 15, comprising a decorrelation means for cancelling out those portions of the audio-channel signals which are correlated with each other.

17. A device as claimed in Claim 16, wherein the decorrelation means comprises for a pair of audio channels:

- a summer having first and second inputs fed by respective outputs of the low-pass filters of the two audio channels;
- a first subtractor having a first input connected to the output of one of the low-pass filters and an output connected to the summing means associated with the one of the low-pass filters;
- a second subtractor having a first input connected to the output of the other of the low-pass filters and an output connected to the summing means associated with the other of the low-pass filters, and
- a coefficient multiplier having an input fed from an output of the summer and an output feeding second inputs of the first and second subtractors.

18. A method for generating artificial reverberation, said method comprising:

synthesizing noise to generate impulse response information for use in a convolution;

performing a convolution based on said impulse response information to generate artificial reverberation.

19. A method as in claim 18 wherein said synthesizing noise comprises generating pseudo-random numbers and wherein said method further comprises:

filtering noise from said synthesizing;

generating a signal envelope from filtered noise.

20. A method as in claim 18 wherein said performing a convolution comprises receiving an input data representing a sound and receiving said impulse response information and generating a plurality of weighted multiplication results from said impulse response information and said input data and summing said plurality of multiplication results.

21. A system for generating artificial reverberation, said system comprising:

means for synthesizing noise to generate impulse response information for use in a convolution;

means for performing a convolution based on said impulse response information to generate artificial reverberation.

22. A method as in claim 21 wherein said means for synthesizing noise comprises means for generating pseudo-random numbers and wherein said system further comprises:

means for filtering noise from said synthesizing;

means for generating a signal envelope from filtered noise.

23. A system as in claim 21 wherein said convolution comprises receiving an input data representing a sound and receiving said impulse response information and generating a plurality of weighted multiplication results from said impulse response information and said input data and summing said plurality of multiplication results.

24. A machine readable medium providing executable program instructions, which when executed by a processing system perform a method for generating artificial reverberation, said method comprising:

synthesizing noise to generate impulse response information for use in a convolution;

performing a convolution based on said impulse response information to generate artificial reverberation.

25. A machine readable medium as in claim 24 wherein said synthesizing noise comprises generating pseudo-random numbers and wherein said method further comprises:

filtering noise from said synthesizing;

generating a signal envelope from filtered noise.

26. A machine readable medium as in claim 24 wherein said performing a convolution comprises receiving an input data representing a sound and receiving said impulse response information and generating a plurality of weighted multiplication results from said impulse response information and said input data and summing said plurality of multiplication results.